

What Is Claimed Is:

1 1. A method for receiving multiple streams of Internet Protocol (IP)
2 packets that are interleaved together into a single stream of transport packets,
3 comprising:

4 receiving the single stream of transport packets, wherein the single stream
5 of transport packets includes multiple streams of IP packets that converted into
6 transport protocol packets and are then interleaved together into the single stream
7 of transport packets;

8 using the single stream of transport packets to reassemble IP packets for
9 the multiple streams of IP packets within a single IP packet buffer;

10 keeping track of the order in which reassembly is completed for IP packets
11 within the single IP packet buffer;

12 reading the IP packets out of the single IP packet buffer in the order in
13 which reassembly is completed; and

14 forwarding the reassembled IP packets to their destinations as specified by
15 IP addresses contained in the IP packets.

1 2. The method of claim 1, wherein keeping track of the order in
2 which reassembly is completed involves maintaining a circular buffer containing
3 pointers to completed IP packets in the single IP packet buffer, wherein a pointer
4 to a completed IP packet is entered into the circular buffer upon completion of the
5 IP packet.

1 3. The method of claim 2, wherein reading the IP packets out of the
2 single IP packet buffer in the order in which packets are completed involves:

3 advancing a buffer pointer around the circular buffer containing pointers to
4 completed IP packets; and

5 reading the completed IP packets through pointers that are pointed to by
6 the buffer pointer;

7 whereby the completed IP packets are read out of the single IP packet
8 buffer in the order in which they were completed.

1 4. The method of claim 1, wherein the single IP packet buffer is
2 organized as a circular buffer, wherein buffers for incoming IP packets are
3 appended to the end of the circular buffer.

1 5. The method of claim 1, wherein reassembling the IP packets from
2 the transport packets involves maintaining a write pointer into the single IP packet
3 buffer for each stream of IP packets, wherein each write pointer points to a packet
4 being reassembled for an associated stream of IP packets.

1 6. The method of claim 5, wherein each write pointer includes:
2 a start pointer that points to the start of a packet being received for the
3 associated stream within the single IP packet buffer;
4 a number of bytes received so far for the packet being received; and
5 logic that calculates the write pointer from the start pointer and the number
6 of bytes received so far.

1 7. The method of claim 1, wherein using the single stream of
2 transport packets to reassemble IP packets involves:
3 receiving a single transport packet that includes an end section of a first IP
4 packet and a beginning section of a second IP packet;

5 directing the end section of the first IP packet to a first location in the
6 single IP packet buffer where the first IP packet is being reassembled; and
7 directing the beginning section of the second IP packet to a second
8 location in the single IP packet buffer where the second IP packet is being
9 reassembled.

1 8. The method of claim 1, wherein the single stream of transport
2 packets includes MPEG2 transport packets.

1 9. The method of claim 1, wherein reassembling IP packets involves
2 filtering transport packets based upon packet identifiers (PIDs) to filter out
3 transport packets containing data that is not of a specified type for the IP packets.

1 10. The method of claim 1, wherein reassembling IP packets involves
2 checking continuity for transport packets to ensure that all transport packets that
3 make up an IP packet are received in sequential order.

1 11. The method of claim 1, further comprising, filtering IP packets
2 based upon media access control (MAC) addresses to filter out IP packets that are
3 not directed to an IP destination address on a local network.

1 12. The method of claim 1, wherein the single stream of transport
2 packets is received from a satellite.

1 13. An apparatus that is configured to receive multiple streams of
2 Internet Protocol (IP) packets that are interleaved together into a single stream of
3 transport packets, comprising:

4 a receiver that is configured to receive the single stream of transport
5 packets, wherein the single stream of transport packets includes multiple streams
6 of IP packets that converted into transport protocol packets and are then
7 interleaved together into the single stream of transport packets;
8 a single IP packet buffer in which IP packets are reassembled;
9 a reassembly mechanism that is configured to reassemble IP packets for
10 the multiple streams of IP packets from the single stream of transport packets;
11 an ordering mechanism that is configured to keep track of the order in
12 which reassembly is completed for IP packets within the single IP packet buffer;
13 a reading mechanism that is configured to read the IP packets out of the
14 single IP packet buffer in the order in which reassembly is completed; and
15 a forwarding mechanism that is configured to forward the reassembled IP
16 packets to their destinations as specified by IP addresses contained in the IP
17 packets.

1 14. The apparatus of claim 13,
2 wherein the ordering mechanism includes a circular buffer containing
3 pointers to completed IP packets in the single IP packet buffer; and
4 wherein the ordering mechanism is configured to enter a pointer to a
5 completed IP packet into the circular buffer upon completion of the IP packet.

1 15. The apparatus of claim 14, wherein the reading mechanism is
2 configured to:
3 advance a buffer pointer around the circular buffer containing pointers to
4 completed IP packets; and to
5 read the completed IP packets through pointers that are pointed to by the
6 buffer pointer;

7 whereby the completed IP packets are read out of the single IP packet
8 buffer in the order in which they were completed.

1 16. The apparatus of claim 13, wherein the single IP packet buffer is
2 organized as a circular buffer, wherein buffers for incoming IP packets are
3 appended to the end of the circular buffer.

1 17. The apparatus of claim 13, wherein the reassembly mechanism
2 includes a write pointer into the single IP packet buffer for each stream of IP
3 packets, wherein each write pointer points to a packet being reassembled for an
4 associated stream of IP packets.

1 18. The apparatus of claim 17, wherein each write pointer includes:
2 a start pointer that points to the start of a packet being received for the
3 associated stream within the single IP packet buffer;
4 a number of bytes received so far for the packet being received; and
5 logic that calculates the write pointer from the start pointer and the number
6 of bytes received so far.

1 19. The apparatus of claim 13, wherein the reassembly mechanism is
2 configured to:
3 receive a single transport packet that includes an end section of a first IP
4 packet and a beginning section of a second IP packet;
5 direct the end section of the first IP packet to a first location in the single
6 IP packet buffer where the first IP packet is being reassembled; and to
7 direct the beginning section of the second IP packet to a second location
8 in the single IP packet buffer where the second IP packet is being reassembled.

1 20. The apparatus of claim 13, wherein the single stream of transport
2 packets includes MPEG2 transport packets.

1 21. The apparatus of claim 13, wherein the reassembly mechanism
2 includes a packet identifier (PID) filter that is configured to filter transport packets
3 based upon packet identifiers (PIDs) in order to filter out transport packets
4 containing data that is not of a specified type for the IP packets.

1 22. The apparatus of claim 13, wherein the reassembly mechanism
2 includes a continuity checker that is configured to check continuity for transport
3 packets to ensure that all transport packets that make up an IP packet are received
4 in sequential order.

1 23. The apparatus of claim 13, further comprising, media access
2 control (MAC) filter that is configured to filter IP packets based upon MAC
3 addresses in order to filter out IP packets that are not directed to an IP destination
4 address on a local network.

1 24. The apparatus of claim 13, wherein the single stream of transport
2 packets is received from a satellite.